extending from the first region to a second elevation and typically having a relatively low density. The first region is typically formed from the fibers that have not been deflected into the deflection conduits, and the second region is typically formed from the fibers deflected into the deflection conduits of the deflection member. The papers made using the belts having a continuous resinous framework and a plurality of discrete deflection conduits dispersed therethrough comprise a continuous high-density network region and a plurality of discrete low-density pillows (or domes), dispersed throughout, separated by, and extending from the network region. The continuous high-density network region is designed primarily to provide strength, while the plurality of the low-density pillows is designed primarily to provide softness and absorbency. Such belts have been used to produce commercially successful products, such as, for example, Bounty® paper towels, Charmin® toilet tissue, and Charmin Ultra® toilet tissue, all produced and sold by the instant assignee.

Typically, certain aspects of absorbency of a fibrous structure are highly dependent on its surface area. That is, for a given fibrous web (including a fiber composition, basis weight, etc.), the greater the web's surface area the higher the web's absorbency. In the structured webs, the low-density pillows, dispersed throughout the web, increase the web's surface area, thereby increasing the web's absorbency. However, increasing the web's surface area by increasing the area comprising the relatively low-density pillows would result in decreasing the web's area comprising the relatively high-density network area that imparts the strength. That is, increasing a ratio of the area comprising pillows relative to the area comprising the network would negatively affect the strength of the paper, because the pillows have a relatively low intrinsic strength compared to the network regions. Therefore, it would be highly desirable to minimize the trade-off between the surface area of the high-density network region primarily providing strength, and the surface area of the low-density region primarily providing softness and absorbency.

Now, it has been discovered that the areas of the high-density region and the low-density region can be effectively de-coupled in a fibrous structure, e.g., that the surface area of the fibrous structure may be increased without sacrificing the strength of the fibrous structure. Specifically, it has been discovered that the surface area of the relatively low-density and absorbent pillows can be sufficiently increased, without

decreasing the area of the relatively high-density network, by forming a novel fibrous structure using a deflection member of the present invention.

Accordingly, the present invention provides a novel strong, soft, and absorbent fibrous structure and a process for making such a fibrous structure. More specifically, the present invention provides a fibrous structure that has at least two regions: a first region having a first elevation and a second region extending from the first region to define a second elevation, the second region having an increased surface area that enhances absorption qualities of the fibrous structure.

SUMMARY OF THE INVENTION

In one embodiment of the present invention, a process is provided for making a fibrous structure, the process includes the steps of: providing a deflection member comprising a macroscopically monoplanar, patterned framework having a backside forming an X-Y plane and a web-side opposite to the backside, wherein the framework comprises a plurality of bases extending from the X-Y plane in a Z-direction perpendicular to the X-Y plane, and a plurality of suspended portions laterally extending from the plurality of bases in at least one direction substantially parallel to the X-Y plane and elevated in the Z-direction from the X-Y plane to form void spaces between the X-Y plane and the suspended portions; providing a plurality of fibers on the deflection member, thereby forming a partly-formed fibrous structure; and separating the partly-formed fibrous structure from the deflection member, thereby forming the fibrous structure.

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is a schematic plan view of an embodiment of a deflection member of the present invention, comprising a framework formed by a first layer and a second layer joined together in a face-to-face relationship, each of the first and second layers comprising a continuous network and a plurality of discrete deflection conduits dispersed therethrough.

FIG. 2 is a schematic instantaneous cross-sectional view of the deflection member shown in FIG. 1, taken along lines 2-2 of FIG. 1, and also showing a fibrous web of the present invention disposed on the deflection member.